

# Non-Functional Testing on Mobile Devices

**Nikolai Pavlov**

A white, stylized cloud graphic is located in the bottom right corner of the slide, partially overlapping the blue background.

# Outline

1. Introduction
2. Functional Requirements
3. Non-Functional Requirements
4. Non-Functional Testing: KPIs
5. Summary

# Introduction

## Nikolai Pavlov

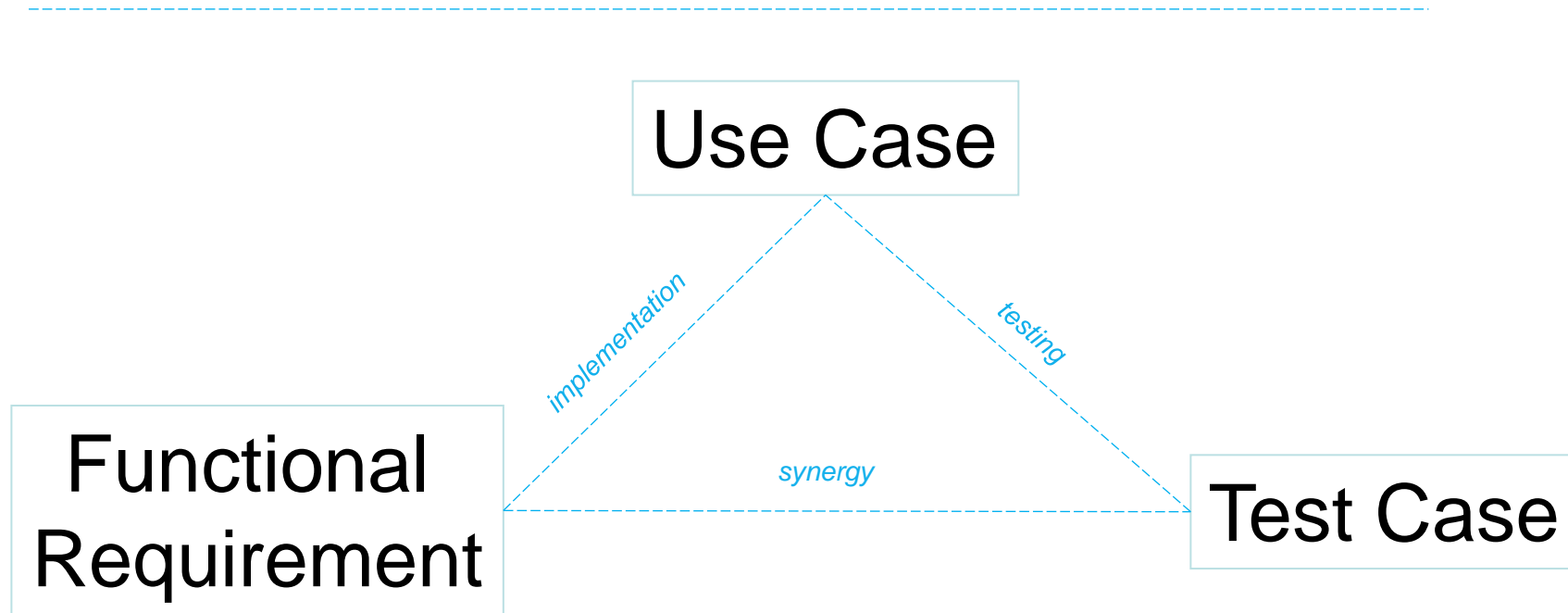
- 2005-2007 Mobile QA Engineer / Skype
- 2007-2008 Technical PM in Mobile / Skype
- 2008-2011 Mobile QE Manager / Skype
- 2011-... Skype Mobile QE Lead / Microsoft
- 2007 TTU, Computer Systems, B.Sc.
- 2011 TU, IT management, MBA

# Requirements

Functional vs. Non-functional

**WHAT? vs. HOW?**

# Functional Requirements



# Non-Functional Requirements

Non-Functional requirements categories:

- Performance
- Security
- Usability
- Localization
- Scalability
- etc.....

# Non-Functional Requirements

Functional vs. Non-functional

User **MUST** be able to sign in

User **MUST** be able to switch application between foreground and background

Sign-in time should be equal or less than 5 seconds

Maximum delay in toggling foreground / background is less than 1 second

# Non-Functional Requirements

- What if we can't meet the requirement?
- How far from meeting the requirement?
- Are we making the right changes?
- ...



# Non-Functional Requirements: KPIs



**WHAT?**



**HOW?**



**DATA**

# Non-Functional Requirements: KPIs



1. Application Size



2. Start-Up time



3. Responsiveness



4. Memory Footprint



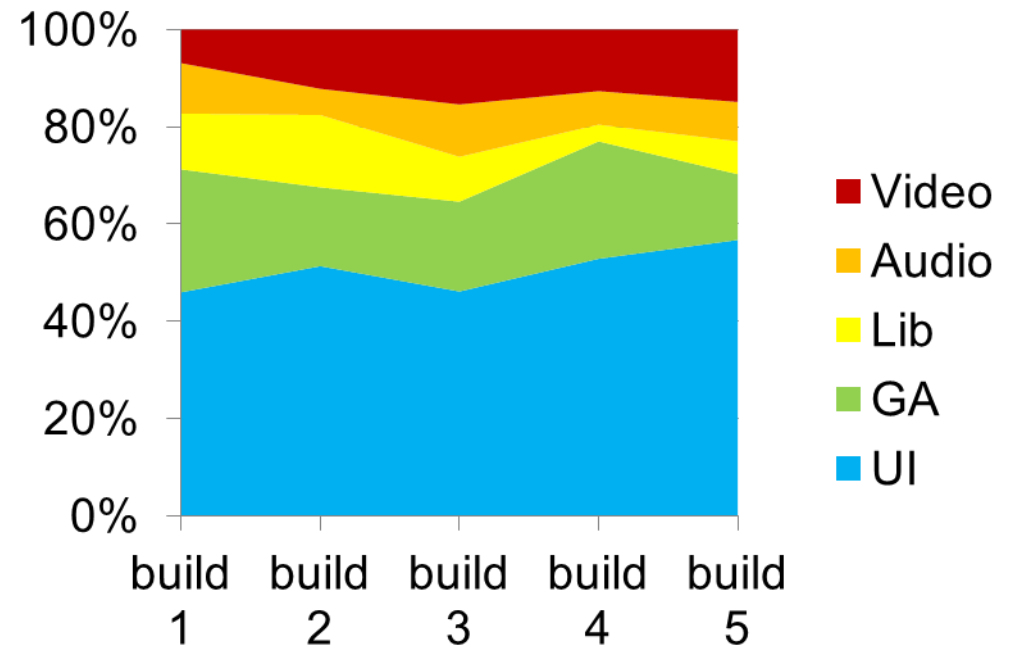
5. Battery Life

# Application Size: How?

**Build x.y.z**



- User Interface
- Graphic Assets
- Library
- Audio Library
- Video Library



# Application Size: Why?



**Monitor**



**Debug**



**Optimize**

# Start-Up: Importance

1. Mobile Users are always in a hurry
2. Competitors
3. Customers

# Start-Up: How?



- 1. Integrate into your automation tests**
2. Use Test Frameworks
3. Use Record-Play

# Responsiveness: Importance

1. Mobile Users are always in a hurry
2. Competitors
3. Customers

# Responsiveness: How?



- 1. Integrate into your automation tests**
2. Use Test Frameworks
3. Use Record-Play



# Memory Footprint: How?

1. Define test suite
2. Define baseline
3. Manual – first, ultimate goal - automate

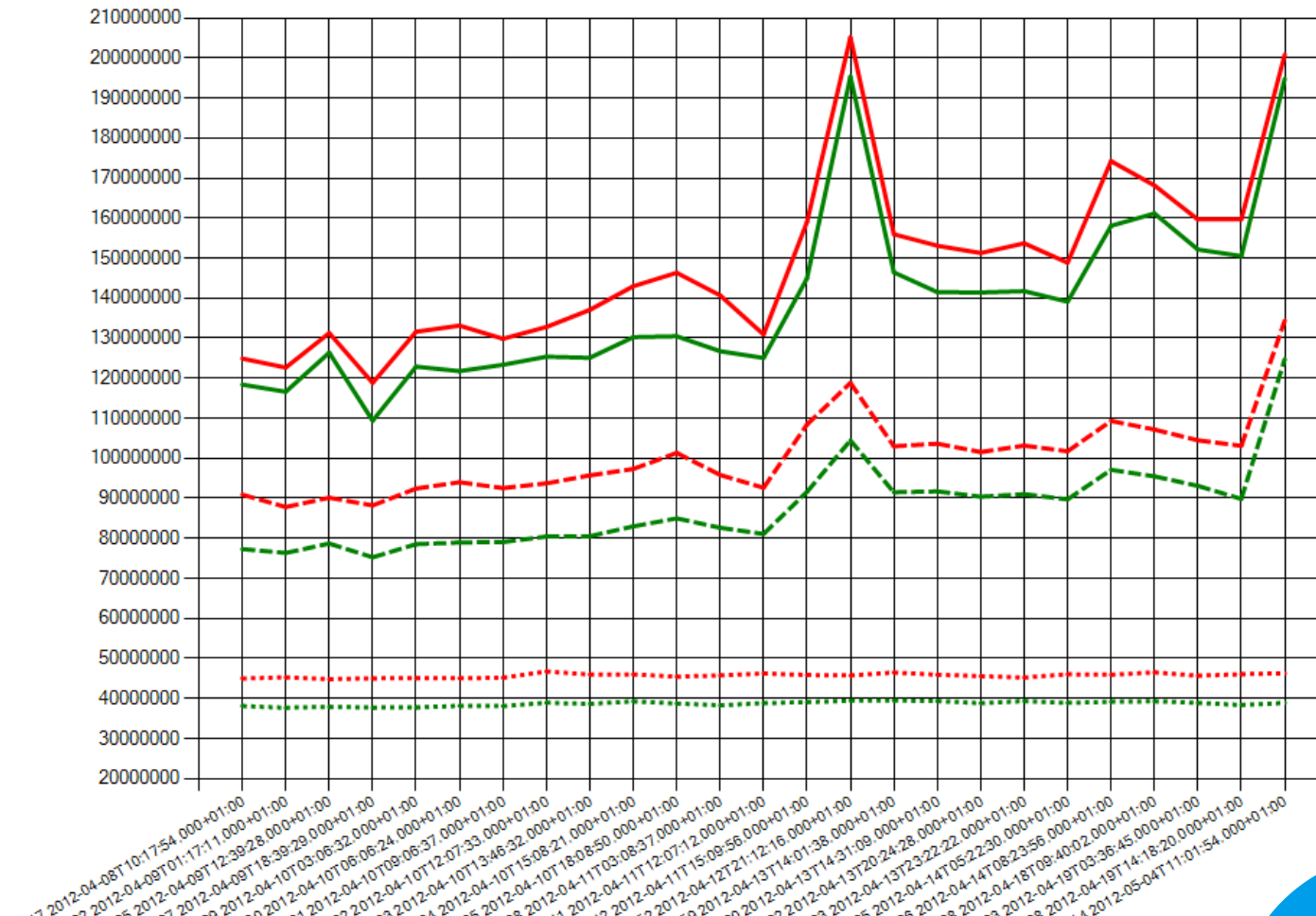
# Memory Footprint: How?

Build Type

all - trunk

Display Peak memory

..... MinPeak    - - - AveragePeak    — MaxPeak    ..... MinCurrent    - - - AverageCurrent    — MaxCurrent



# Memory Footprint: How?



WP Performance  
Analysis tool

Device Status for  
Windows Phone



DDMS

android.os.Debug

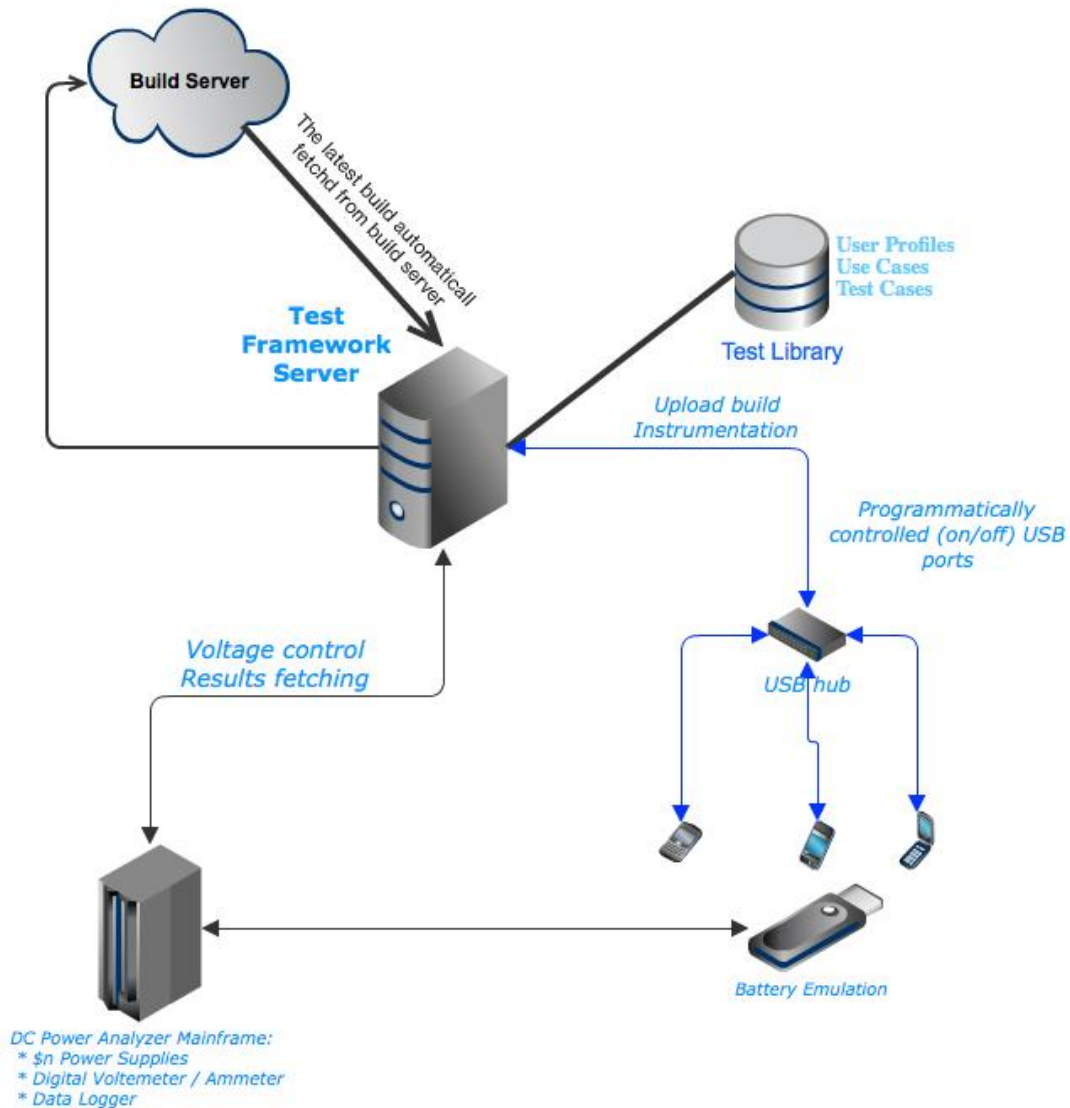


xcode Instruments

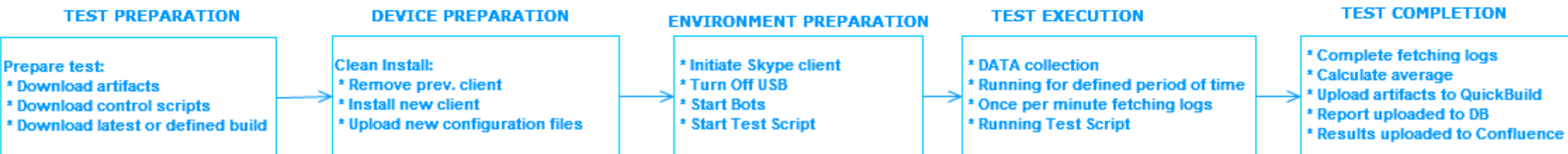
# Battery Consumption: Why?

- Provide visibility to battery consumption changes with every new integration
- Provide battery consumption data to main stakeholders and partners
- Provide battery consumption data for making decisions

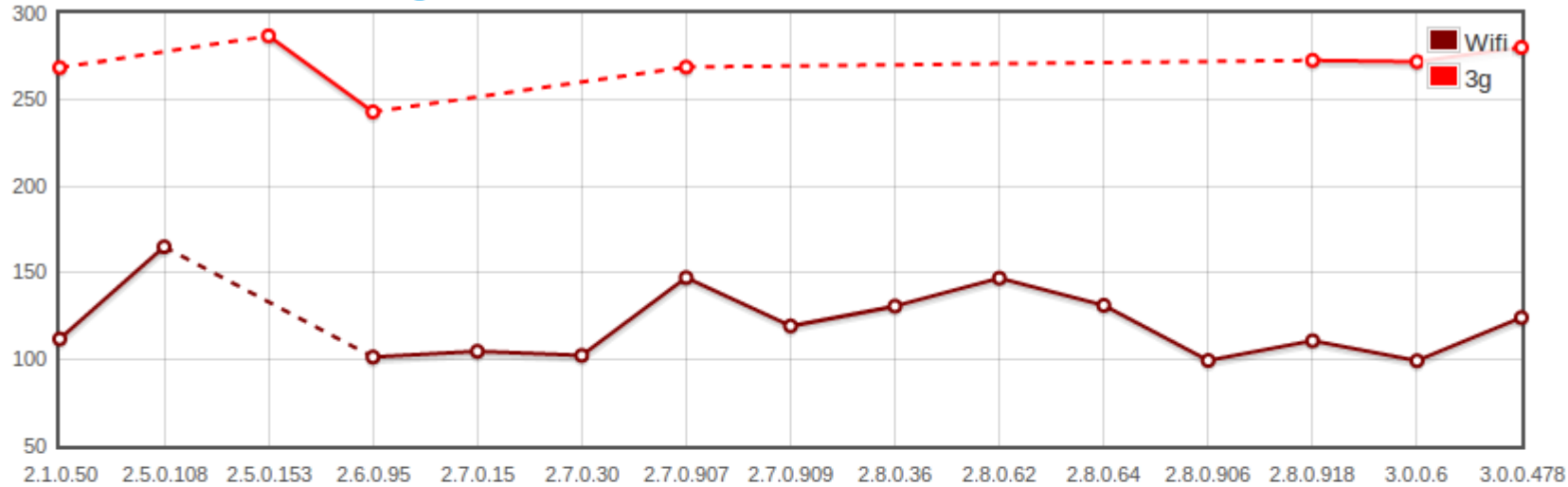
# Battery Consumption: How?



# Battery Consumption: How?



# Battery Consumption: How?



Tests	Client	Client version	Current mAh	Battery life	Date	Device	Device version	Profile	Connectivity	Client mode
▶ 3	Android: raider	2.1.0.50	268.59	5.17	2012-03-29	Nexus S	2.3.6	average	3g	foreground
▶ 2	Android: raider	2.1.0.50	111.75	12.42	2012-03-29	Nexus S	2.3.6	average	wifi	foreground
▶ 2	Android: raider	2.5.0.108	165.00	8.53	2012-03-29	Nexus S	2.3.6	average	wifi	foreground
▶ 3	Android: raider	2.5.0.153	286.95	4.84	2012-03-29	Nexus S	2.3.6	average	3g	foreground
▶ 6	Android: raider	2.6.0.95	243.00	5.72	2012-03-29	Nexus S	2.3.6	average	3g	foreground
▶ 19	Android: raider	2.6.0.95	101.27	13.97	2012-03-29	Nexus S	2.3.6	average	wifi	foreground
▶ 4	Android: raider	2.7.0.15	104.58	13.27	2012-03-29	Nexus S	2.3.6	average	wifi	foreground
▶ 3	Android: raider	2.7.0.30	102.21	13.76	2012-03-29	Nexus S	2.3.6	average	wifi	foreground
▶ 3	Android: raider	2.7.0.907	147.18	9.54	2012-03-29	Nexus S	2.3.6	average	wifi	foreground

Questions

